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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,283	10/18/2005	Guillaume Bouche	61170-00022USPX	1856
32914 7590 08/10/2007 GARDERE WYNNE SEWELL LLP INTELLECTUAL PROPERTY SECTION 3000 THANKSGIVING TOWER 1601 ELM ST DALLAS, TX 75201-4761			EXAMINER DOUGHERTY, THOMAS M	
			ART UNIT 2834	PAPER NUMBER
			MAIL DATE 08/10/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/537,283

Applicant(s)

BOUCHE ET AL.

Examiner

Thomas M. Dougherty

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 May 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11, 16-22 and 29-33 is/are pending in the application.
- 4a) Of the above claim(s) 29-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 16-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1205, 706</u>   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

Newly submitted claims 29-33 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: the new claims are related as a subcombination to the elected claims. As noted the subcombination has separate utility such as a sensor, a motive component, an array component for acoustic devices etc.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 29-33 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 6, 7, 10, 11, 17, 19, 22 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Barber et al. (EP 1 158 671 A1). Barber et al. show (e.g. fig. 2) a support for an acoustic resonator, comprising: at least one bilayer assembly comprising: a layer of high acoustic impedance material (130d); and a layer of low acoustic impedance material (135d) made of a low electrical permittivity material.

The electrical permittivity of the low acoustic impedance material (135d) is less than about 4. Note that the relative permittivity of  $\text{SiO}_2$  is 3.9. See conclusion below.

The support comprises no more than two bilayer assemblies. See fig. 3.

The high acoustic impedance material comprises at least one material selected from the group consisting of: **aluminum nitride** (130d in fig. 2), copper, nickel, tungsten, gold, platinum, molybdenum.

Barber et al. show (e.g. fig. 1) an acoustic resonator comprising: an active element (110) and a support (see figs. 2-4) having at least one bilayer assembly comprising: a layer of high acoustic impedance material (130d) and a layer of low acoustic impedance material (135d) made of a low electrical permittivity material.

The active element comprises at least one piezoelectric layer (110) placed between electrodes (105, 115).

The electrical permittivity of the low acoustic impedance material (135d) is less than about 4. Note that the relative permittivity of  $\text{SiO}_2$  is 3.9. See conclusion below.

The high acoustic impedance material comprises at least one material selected from the group consisting of: **aluminum nitride** (130d in fig. 2), copper, nickel, tungsten, gold, platinum, molybdenum.

The support comprises no more than two bilayer assemblies. See fig. 3.

Claims 1, 2, 6-11, 17, 19-22 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Inoue (US 2005/0093399). Inoue shows (fig. 1) a support for an acoustic resonator, comprising: at least one bilayer assembly comprising: a layer of high acoustic impedance material (111); and a layer of low acoustic impedance material (112) made of a low electrical permittivity material.

The electrical permittivity of the low acoustic impedance material (112) is less than about 4. Note that Inoue indicates the permittivity as being 4.29 at paragraph [0036] that is at least about 4.

The support comprises no more than two bilayer assemblies. See claim 2.

The high acoustic impedance material comprises at least one material selected from the group consisting of: **aluminum nitride** (111), copper, nickel, tungsten, gold, platinum, molybdenum.

The layer of high acoustic impedance material has a thickness of between 0.3 and 3.2  $\mu\text{m}$ . See paragraph [0036].

The layer of low acoustic impedance material has a thickness of less than 0.7  $\mu\text{m}$ , preferably between 0.3 and 0.7  $\mu\text{m}$ . See paragraph [0036].

Inoue shows (e.g. fig. 1) an acoustic resonator comprising: an active element (103) and a support (110) having at least one bilayer assembly comprising: a layer of high acoustic impedance material (111) and a layer of low acoustic impedance material (112) made of a low electrical permittivity material.

The active element comprises at least one piezoelectric layer (103) placed between electrodes (102, 104).

The electrical permittivity of the low acoustic impedance material (112) is less than about 4. Note that Inoue indicates the permittivity as being 4.29 at paragraph [0036] that is at least about 4.

The high acoustic impedance material comprises at least one material selected from the group consisting of: **aluminum nitride** (111), copper, nickel, tungsten, gold, platinum, molybdenum.

The layer of high acoustic impedance material has a thickness of between 0.3 and 3.2  $\mu\text{m}$ . See paragraph [0036].

The layer of low acoustic impedance material has a thickness of less than 0.7  $\mu\text{m}$ , preferably between 0.3 and 0.7  $\mu\text{m}$ . See paragraph [0036].

The support comprises no more than two bilayer assemblies. See claim 2.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8, 9, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barber et al. (EP 1 158 671 A1). Given the invention of Barber et al. as noted above, they don't disclose the thicknesses of their layers.

It would have been obvious to one having ordinary skill in the art to have the layer of high acoustic impedance material have a thickness of between 0.3 and 3.2  $\mu\text{m}$  and the layer of low acoustic impedance material have a thickness of less than 0.7  $\mu\text{m}$ , preferably between 0.3 and 0.7  $\mu\text{m}$ , since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 3-5, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Barber et al. (EP 1 158 671 A1) or Inoue (US 2005/0093399) further in view of Kuramasu et al. (JP 9-275323). Given the inventions of both Barber et al. and Inoue, neither shows use of a material whose relative electrical permittivity is less than about 2.5 or less than about 3, and whose low acoustic impedance material comprises SiOC.

Kuramasu et al. show use of SiOC, a low acoustic impedance material, wherein the relative electrical permittivity of the low acoustic impedance material is less than about 2.5 and thus less than about 3 in a piezoelectric resonator structure.

Kuramasu et al. don't show a bilayer of low acoustic impedance material and high acoustic impedance material. However they do teach the interchangeability of the materials by noting optionally that either silicon oxide or silicon oxide carbide can be employed.

It would have been obvious to one having ordinary skill in the art to employ the silicon oxide carbide film of Kuramasu et al. for the silicon oxide film of either Barber et al. or Inoue at the times of either invention since these materials are known for their similar properties and one may obviously be substituted for the other as Kuramasu et al.

Art Unit: 2834

teach. Additionally, it would have been obvious to one having ordinary skill in the art at the time either of the Barber et al. or Inoue inventions were made to employ SiOC in place of their silicon oxide since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

### **Conclusion**

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Konaka et al. (US 4,651,411) note the relative permittivity of silicon oxide as 3.9 at col. 3, lines 50-51. Ozawa et al. (US 2004/0253828) indicate interchangeability of Silicon Oxide and Silicon Oxycarbide in paragraph [0348].

Direct inquiry to Examiner Dougherty at (571) 272-2022.

tmd  
tmd

July 11, 2007

  
TOM DOUGHERTY  
PRIMARY EXAMINER